REPORTS ON ACHIEVEMENT MOTIVATION
BARPALI, INDIA

by

Thomas M. Fraser, Jr.

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REPORTS ON

ACHIEVEMENT MOTIVATION

Prepared for

Barpali Village Service
(American Friends Service Committee)

District Sambalpur
Orissa, India

by

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I. MOTIVATIONAL RESEARCH IN COMMUNITY DEVELOPMENT

Motivation as a Factor in Development.

Professor David C. McClelland, in a paper prepared for the Conference on Community Development,[1] argues that economic development (and its constituent part, community development) are dependent upon the vigorous individual activity of persons behaving in an entrepreneurial manner. The reason for this type of behavior is a motivational complex containing a strong need for "achievement." There is evidence that this motivational complex is in short supply in "underdeveloped countries," thus explaining their lower economic productivity to date, and indicating that to increase this productivity the number of individuals with the entrepreneurial motivational complex must be significantly increased. Community development programs today tend to "help people as they are" rather than changing them so that they may eventually be able to help themselves. Program emphasis is usually placed on agricultural production, thus strengthening the agricultural element of the community which is usually the most conservative and tradition-bound; and also tending to remove a source of community discontent which might have acted as a factor in bringing about social change.

As an alternative to the "standard" program of community development McClelland proposes a shift in emphasis toward changing the values and

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[1] David C. McClelland, "Community Development and the Nature of Human Motivation, Some Implications of Recent Research," Background Paper, Conference on Community Development. Cambridge, Center for International Studies, Massachusetts Institute of Technology, Dec. 13-15, 1957.

motives of the members of the community. There are three main methods for bringing about such changes: 1) by persuasion or education, 2) by changing the social system so that new motives and values will be encouraged, and 3) by early character training. The third method is psychologically by far the most effective; it is also, practically, the most difficult to achieve, as most of the "enculturation" of a child is accomplished in his family unit. The action program which McClelland recommends puts major stress on the establishment of nursery schools and kindergartens, and the training of a cadre of teachers for these and for primary schools who would include in their curricula, as well as conventional "subjects," character training aimed at developing the type of values and motives needed for entrepreneurship and economic development. He argues that, morally, such "character manipulation" is, in fact, no different from forcing inoculation on people who do not understand the "germ theory" of disease, as the ultimate goal of economic development is agreed to be, like health, a desirable end. More immediate, though less fundamental, strides can be made by identifying individuals with entrepreneurial motivation and placing them in key positions within the society (e.g., as teachers, as village level workers, and as business managers).

Measurement of Achievement Motivation.

Because more is known psychologically about "achievement motivation" than about other motivational patterns in the entrepreneurial complex, McClelland uses this one factor as an index, which research has proven relatively reliable, of the degree to which the whole complex is present within a group (McClelland's techniques are not sufficiently

refined, or the Achievement motivation factor does not correlate sufficiently highly with the total complex to enable data to be completely reliable for individual cases). Achievement motivation, as defined by McClelland, is motivation to do well or excell without regard to any sort of reward. In this respect it is an irrational drive with self-gratification as the goal of one's effort. Individuals whose Achievement motivation has been shown objectively to be high tend to work harder, learn faster, and do better work than those with low Achievement motivation. They are more apt to be resistant to social pressure, and to social or material rewards. The optimal situation for performance of such individuals is one in which the results of the individual's efforts can be known to him, where the responsibility for the success or failure of the venture rests wholly, or to a large extent, upon him and where there is a certain amount of risk of failure involved.

Assuming that McClelland's hypotheses about the relationships between Achievement motivation and economic development are correct, objective measurement of this factor becomes desirable, if not essential, as a tool in programs to foster economic development or community development, even if they are the "standard" type of programs. Thus differing group levels of Achievement motivation provide a measure for predicting differences between the groups in rate of entrepreneurial growth, while high degrees of individual Achievement motivation predispose the individual to "act like a business entrepreneur." In his research on Achievement motivation, McClelland has found a far higher correlation between this factor in one generation and development in the next, therefore he has stressed the point that high Achievement motivation is

a prediction of rather than an accompaniment to economic growth. Because of this factor and because of classical psychological theory, he has emphasized character training in nursery and primary school, as outlined above, as the most effective means of developing motives and values predisposing a society to development.

To arrive at an objective measurement of Achievement motivation, McClelland has designed relatively simple tests to measure "n-Achievement," that is, a numerical coefficient indicating the relative degree of Achievement motivation for a group expressed in terms of some measure of central tendency. Test responses indicating "achievement ideas" or "images" and their sub-types are simply added to obtain the individual or group totals. One test, the "Doodle" test, consists of briefly exposing to the subject a sheet covered with meaningless designs. The subject then tries to reproduce on paper what was on the test sheet. The number of "achievement images" contained in the protocol is the subject's score, or his "n-Achievement." The "Ring Toss" test presents the subject with a task to complete in an unstructured situation: a peg is placed in the ground and the subject given a ring to throw over it ten times with no instructions as to where to stand or what is expected of him in terms of success or failure. This test is scored on the basis of the distribution of the distances from which the ring was thrown and the number of successful tosses, the highest scores resulting from a combination of partial successes at distances great enough to be challenging but not impossible.

Application of Motivational Research to B.V.S. Program.

Without altering the basic aims and ideals of Barpali Village Service (B.V.S.) or the concepts guiding American Friends Service

Committee (AFSC) foreign service work, much of McClelland's motivational theory, outlined above, could be applied to the Orissa Project.[2] Indeed, some applications of this theory might be of considerable value, particularly in predictive or diagnostic terms, to present activities of the Project; while more radical concepts, if they were to be approved for trial application, would in no way conflict with or hinder on-going programs. The applications outlined below are among those which might be tried on an experimental basis in the Barpali Project:

1. By testing carefully chosen samples of the adult population, group scores could be obtained, reflecting differences, if any, in Achievement motivation between different villages, occupational groups, economic strata, factions and other groups. These scores could then be correlated with factors such as the degree of acceptance of B.V.S. or Government community development programs, and with more subjective criteria of progress or development. Working on the theory of "marginal improvement," positive correlations would indicate the types of groups that would be most likely to be receptive to or benefited by developmental innovation.

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[2] Barpali Village Service was a ten-year (1952-62) community development project in Sambalpur District of western Orissa, undertaken by the American Friends Service Committee (Quakers) as a concrete manifestation of Friends' religious convictions. For details of the project see, Social and Technical Assistance in India. Philadelphia: American Friends Service Committee, 1956; Thomas M. Fraser, Jr., "Barpali Village Service, A Quaker Experiment in Community Development." Journal of Human Relations, Vol. 9, No. 3, 1961. Pp. 285-299; Fraser, "Sociocultural Parameters in Directed Change." Human Organization, Vol. 22, No. 1, 1963. Pp. 95-104; and Fraser, Barpali, Case Studies in Community Development, to be published, 1968.

2. Particularly high individual scores, along with other objective and subjective evidence could be used to identify potential progressive leaders. These men could be helped, either by the encouragement of B.V.S. village workers or by Government placement, to attain responsible entrepreneurial positions (e.g., manager of cooperative societies).

3. On the basis of children's Achievement motivation scores much of the data outlined in the first point, above, could be obtained. Such scores would also indicate which groups of children would be most apt to be benefited by school curricula including "character training" such as McClelland suggests.

4. The most radical step in using the motivational approach to community development would be the undertaking of a school and teacher training program designed to develop in children of the area Achievement motivation and other motivational patterns in the entrepreneurial complex. The main objections to such a step would include delineation of areas of authority between Government and B.V.S. in school administration; selection, training and payment of teachers; and the problem of follow-through on a program which might not begin to show results for a quarter of a century, and might possibly show no results at all. However, McClelland presents evidence that this method may be the most effective means at our command for the development of underdeveloped areas in long-range perspective. It in no way precludes the continuation of

present short-term developmental programs. Such a program, once started by B.V.S., would probably be continued either by B.V.S., Government, or an outside agency with research grants for that purpose, after the withdrawal of AFSC; and quite probably, even if it were not continued, a B.V.S. school program operating for four years could do much in the way of motivational development of the children of the area.

The four points presented above in no way exhaust the applications of motivational research to community development in general of B.V.S. in particular. They point out, rather, ways in which motivational theory may be used to supplement programs which are mainly economic, sociological or humanitarian in outlook. Particularly in regard to the fourth point, no program should be undertaken without a great deal of careful consideration and specific planning for the whole span of the program as well as its immediate future. However, it seems that programs such as these, even if their successful outcomes cannot be assured, might naturally be integrated into the avowedly experimental framework of the B.V.S. program.

(November, 1958)

II. MEASURING ACHIEVEMENT MOTIVATION

Preliminary Study and Proposals for Further Research

1. Introduction. The following is based on the results of a preliminary testing program using the Graphic Expression (Doodle) test for measuring achievement motivation.[1] Testing samples included eleven village level workers, eleven female health workers and four student health workers, and nine mechanical trainees. In all these cases, the subjects and their performance in different aspects of developmental work were known to one or more technicians of the Barpali Village Service (B.V.S.), so that objective evaluation criteria could be correlated with the testing results. A further sample of 146 school children from Grades II junior, II, and III, representing eight different schools of the district was tested. Schools in all the villages where B.V.S. maintains workers were roughly divided into good, fair and poor in their educational standards, and from them, three of the "good" and five of the "poor" were chosen for the test sample.

The hypothesis underlying the testing program is that put forth by David McClelland,[2] that high achievement motivation is the key to successful economic development both at the community and at the national

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[1] Elliot Aronson, "The Need for Achievement as Measured by Graphic Expression." In John W. Atkinson (ed.), Motives in Fantasy, Action and Society. Princeton, Van Nostrand, 1958. Pp. 249-265 and 819-830.

[2] David C. McClelland, "Community Development and the Nature of Human Motivation, Some Implications of Recent Research," Background Paper, Conference on Community Development. Cambridge, Center for International Studies, Massachusetts Institute of Technology, Dec. 13-15, 1957.

level. According to this hypothesis, individuals with a high n-Achievement (quantitative score) have an irrational drive to excell at any task without regard to reward. They tend to work harder, learn faster and do better work than those with low achievement motivation, and they are more apt to be resistent to social pressure. As many developmental programs have found that present extension methods affect only the relatively well-off and conservative agricultural elements of the community, and even widen the gulf between them and the marginal cultivators and landless persons, it is argued that only by locating and utilizing, or by developing for utilization, entrepreneurs with high achievement motivation can local and national economic standards be significantly raised on a broad base.

Although this test was developed using primarily western subjects, it is believed that because of the probable lack of cultural content it can be applied cross-culturally to produce valid comparative results. It can be assumed with even more certainty that as a relative measure within a social group, the results will produce a measure of at least western-type achievement motivation. As economic development at present is thought of in terms of and by comparison with western economies, such a relative measure can still be of great use in developmental programs even if results from one society are not strictly comparable with those from another.

2. Procedure. Two stimulus designs, described by Aronson[3] were reproduced on heavy white paper, 22" x 30", each sheet having a wooden

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[3]Aronson, op. cit., pp. 250-51.

wooden strip stapled to top and bottom to increase durability and to insure complete unrolling when exposed to the subjects. Each subject is given a pencil and two sheets of 8" x 11" mimeograph paper. The following instructions are given on Oriya by one member of the testing team: (See Figure 1.)

> Put your name on the top edge of each piece of paper. In a moment I am going to show you briefly a page with a lot of marks on it. These form a very complicated design. I want you to put down on your paper whatever you think you saw. The designs are so complicated that you will not be able to see them very well in such a short time, but put down whatever you think was there or might have been there, even though you are not sure what it was. Be sure to look carefully at the design when I say "now." I will only show you the design for a moment.

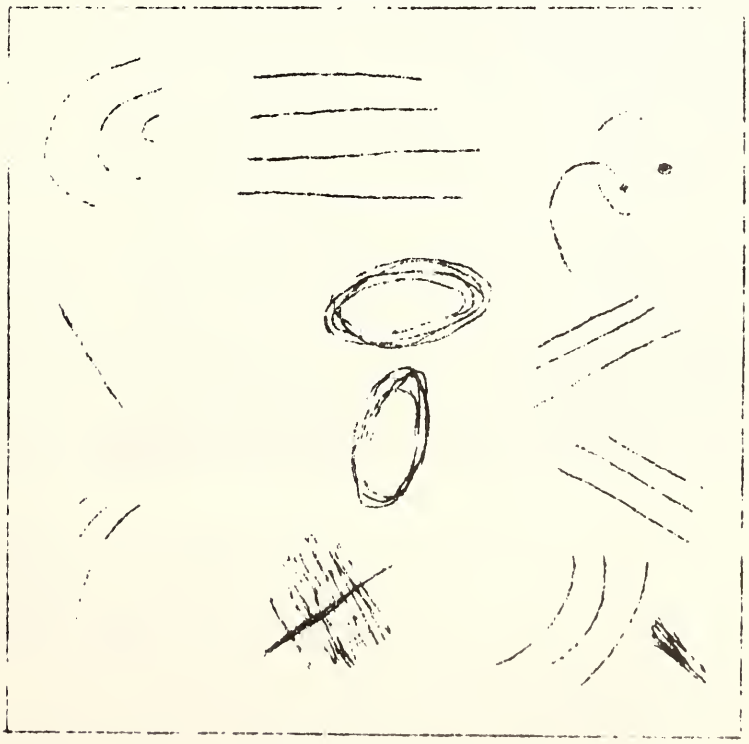
Frequently these instructions had to be repeated or amplified, particularly for school subjects not familiar with testing procedures. After the test was in progress it was occasionally necessary to tell the subjects to "draw" not "write" their responses, or that they could "put down as many designs as they liked" (some apparently interpreted the instructions as meaning to choose <u>one</u> design to reproduce perfectly).

For each of the two parts of the test, the stimulus design was exposed for approximately 1.5 seconds from complete unrolling to removal from view. Subjects were then allowed to draw for two or three minutes, depending on how well they seemed to get down to the job of drawing and also depending on their facility at drawing. Younger students more frequently needed a longer time than older, and

Figure 1

Stimulus Designs for Measuring Achievement Motivation by Graphic Expression

Stimulus Design I



Stimulus Design II

(After Aronson, op. cit.)

because of the unfamiliarity with the procedure, Design I more often than Design II. As testing was always done in groups, the problem of copying arose in some instances. Because the amount of copying, as well as its effect upon the test scores varied from group to group, little attempt was made to stop it. A record was kept of who copied from whom, and, except in one group, scores of copiers were as different from those from whom they copied as they were from other subjects. However, to avoid this problem completely, it is planned in future testing programs to work with smaller groups which can be well spread out.

3. Results. Each paper was scored using the criteria outlined by Aronson [4] in the following categories: discrete lined (D), fuzzy lines (F), the sum of D and F (DF), the amount of space between the lowest mark and the bottom of the page, measured in centimeters (Sp.), diagonal lines (Di.), S-shaped lines (S), and multiwave lines (MW). D, DF, Di. and S have positive correlation with achievement motivation, while F, Sp. and MW correlate negatively.[5] In the preliminary testing results, below, correlations have only been made between DF and other evaluation criteria, as this seemed to be the most stable single category and as some of the additional categories appear to have been affected by the testing situation. The following table presents means and standard deviations for each of the scoring categories in each of

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[4] Ibid., pp. 252-57.

[5] Ibid., Table III, p. 258.

the groups tested. Inspite of the low N's for each group it was decided to treat each grade of each school separately as there was often more difference in scores between grades in one school than between the same grades in different schools.

Means and Standard Deviations

School & Grade		N		D	F	DF	Sp.	Di.	S	MW
Sujia	IIjr	4	M	9.50	2.25	7.50	25.25	0.50	1.75	1.25
			SD	2.06	1.09	1.48	8.75	0.50	1.79	0.85
(poor)										
	II	7	M	13.70	1.30	12.40	28.30	2.00	0.43	1.29
			SD	7.08	1.28	6.42	10.47	2.33	0.49	1.62
	III	5	M	19.60	3.40	16.20	9.20	1.60	0.60	2.80
			SD	8.16	2.42	6.56	3.91	1.63	1.20	2.23
Burkel	IIjr	5	M	7.20	1.60	5.60	39.40	0.60	0.00	1.60
			SD	3.18	1.36	3.67	7.17	0.80	0.00	1.02
(poor)										
	II	3	M	12.67	0.33	12.33	29.67	0.67	0.00	1.33
			SD	2.49	0.47	2.05	2.62	0.94	0.00	0.47
	III	4	M	10.00	2.50	7.50	25.50	1.75	0.00	1.50
			SD	3.93	1.66	3.35	6.53	1.09	0.00	0.87
Bandhpali	II	10	M	6.90	1.40	5.50	40.60	0.70	0.30	2.00
			SD	3.83	1.38	2.40	4.24	1.01	2.02	0.64
(good)										
	III	9	M	11.00	2.33	8.68	31.22	1.88	0.55	3.00
			SD	7.95	2.26	7.53	4.98	2.42	1.06	1.33
Bisipali	IIjr	14	M	7.70	3.20	4.50	21.40	1.26	0.07	2.57
			SD	9.60	2.46	8.68	7.27	2.12	0.81	2.80
(good)										
	II	12	M	8.25	3.17	5.08	22.50	0.91	0.33	2.25
			SD	4.06	1.91	3.77	8.69	0.78	0.60	1.09
	III	12	M	11.75	4.93	6.82	27.80	2.42	0.25	4.50
			SD	7.37	2.87	6.91	9.26	3.60	0.59	3.04
Kusanpuri	IIjr	6	M	7.83	0.83	7.00	23.17	1.17	0.67	0.83
			S	3.02	1.46	3.56	7.10	0.69	1.11	0.61
(poor)										
	II	6	M	5.50	1.33	4.17	30.67	0.67	0.50	1.83
			SD	2.50	0.75	3.13	8.55	0.94	1.12	0.93
	III	4	M	6.00	1.50	4.50	29.00	1.75	0.00	0.75
			SD	2.55	1.50	1.66	10.13	1.48	0.00	0.83

Means and Standard Deviations (continued)

School & Grade		N	D	F	DF	Sp.	Di.	S	MW
Haldipali	IIjr	6 M	6.17	0.33	5.83	35.67	0.17	0.00	0.00
		SD	2.90	0.48	3.34	4.10	0.12	0.00	0.00
(poor)									
	II	6 M	8.33	3.67	4.67	32.67	0.33	0.17	2.50
		SD	5.80	1.85	6.58	8.50	0.47	0.19	0.95
	III	8 M	7.01	2.64	4.50	31.38	0.50	0.13	4.25
		SD	8.20	2.23	9.05	5.10	0.71	0.33	4.55
Lenda	IIjr	9 M	5.89	5.22	0.67	28.77	0.67	0.11	2.22
		SD	5.50	3.25	7.26	6.10	1.03	0.32	1.30
(good)									
	II	8 M	6.25	2.25	4.00	26.13	1.25	0.13	1.75
		SD	1.56	1.09	1.87	4.26	0.83	0.33	0.83
	III	9 M	9.12	3.75	5.37	22.00	1.63	0.38	2.38
			4.25	1.71	5.38	8.30	1.22	0.69	1.22
Ambapatra	IIjr	4 M	4.50	1.25	3.25	30.00	0.50	0.25	1.25
		SD	3.64	1.30	4.91	7.28	0.87	4.30	1.09
(poor)									
	II	8 M	6.13	4.00	2.13	26.75	0.50	0.75	2.00
		SD	3.21	2.06	4.70	6.63	0.71	0.66	2.78
	III	4 M	6.00	7.50	-1.50	8.00	2.25	0.00	3.75
		SD	1.87	1.50	2.69	1.22	1.48	0.00	1.25
Village Level Workers		11 M	11.50	3.45	8.10	14.55	3.00	0.18	3.45
		SD	5.02	4.04	7.85	5.21	1.04	0.39	1.78
Health Workers (incl. trainees)		15 M	16.13	3.53	12.60	18.60	2.07	1.00	5.00
		SD	6.91	4.16	8.67	7.18	2.42	1.71	3.26
Mechanical Trainees		9 M	13.56	6.67	6.89	9.11	2.00	1.00	5.67
		SD	7.47	4.28	9.44	5.84	2.05	1.63	3.09

Prior to the testing each village level worker had been rated by teachnicians of B.V.S. in the following categories: Cooperation, Initiative, General Ability, Follow-Through, and Work with Villagers. Ratings were either "Excellent," "Good," "Fair," or "Poor," and

thus could be easily quatified (i.e., 4, 3, 2, 1) producing Quartile scores. Total scores from this evaluation were correlated with the DF score giving a positive r = .68. The mechanical trainees were rated by the course instructor in simple rank order which was correlated with the DF score giving a positive r = .74. Both r's are significant at the .05 level but not at the .01 level. Although evaluations of the health workers by medical technicians have not been fully tabulated, it appears that these categories (i.e., Ability to Learn, Initiative, Work with Patients, Work with Villagers) will correlate as highly with DF as the evaluations of the village level workers and mechanical trainees.[6]

For each school child tested, the following information is being collected by village level workers located in the school villages:

1. Name, sex, grade of each child (given on test paper).
2. Age of child.
3. Child's most recent school grades, and class rank.
4. Number of adults in household.
5. Number of children in household.
6. Primary and secondary occupations of father.
7. Number of acres owned by father or other family members (if father is an agriculturist, his relative economic status can be judged by this figure, otherwise his occupation will be used to determine his status).
8. Caste.
9. What position of formal or informal leadership does the father hold in the community or his caste.

10. What improvements (from B.V.S. or National Extension Service) has the family accepted (e.g., latrines, Japanese paddy cultivation, family planning, etc.).

There are indications that there may be significant correlations between n-Achievement measures and some of these categories, and between the scores and the type of instruction found in the various schools. These will be discussed in the following section.

4. Discussion. Although complete results are not available for even the preliminary samples, there are enough data to suggest the following hypotheses. 1) That there is a significant relationship between achievement motivation, as measured by graphic expression, and developmental initiative and leadership. 2) That the concept of "good" and "poor" educational standards is not a valid indication of the success of a particular school in developing high achievement motivation in its students, or 3) that there is a more significant relationship between the caste or social group to which an individual belongs and his achievement motivation than there is between educational standards and the development of achievement motivation within an individual.

The relationship between achievement motivation and developmental initiative and leadership is indicated by the positive correlations found between DF scores and the evaluation of village level workers and the ranking of the mechanical trainees. The ranking of the trainees was based primarily upon their general mechanical ability as shown in

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[6] Comparison of subsequent evaluations with those already considered and with DF scores indicates that no significant correlation will be found in the case of the health workers. This observation, if correct, suggests several interesting hypotheses concerning both the Health Worker Training Program and the impact of the graduates on their villages.

the course and their initiative in working out solutions to problems on their own using the basic mechanical principles they had learned. It will be interesting to observe which of these individuals, after completing their training, set themselves up as mechanical entrepreneurs in their villages. If the foregoing assumptions and hypotheses are valid, it is to be expected that those with the higher n-Achievement scores will tend to take this form of occupation rather than continuing in agricultural pursuits alone. In evaluating the village level workers, it was desired to obtain a measure of their effectiveness as catalysts in the process of village development or their ability at organizing villagers for developmental action. It is probably significant that the village level worker scoring highest in n-Achievement scores and rated highest in the evaluations of all technicians, was criticized by two technicians as being "too good" as a village worker. That is, it was felt that he assumed too much initiative and too much leadership in village affairs, so that the villagers were relying upon him rather than developing village self-reliance. However, if this man were a villager and not a village level worker, his high achievement motivation, leadership and initiatiye would be indigenous rather than external and would be a positive factor in his community's self-development. Because the village level workers dedicated themselves to an ideal of a type of "village uplift," those with higher n-Achievement scores, rather than exhibiting what might be called entrepreneurial behavior, show more of a missionary zeal in their work. In this connection, it would be of interest to compare measurements of achievement motivation of the village level workers of B.V.S. with those of National Extension Service (NES) village level workers who for the most part are simply doing a job in the Government heirarchy.

In selecting the schools for testing an effort was made to chose some of the poorest schools in the area and some of the best, with the expectation that achievement motivation would be higher in the better schools. As can be seen from the figures presented in the last section, this expectation was not fulfilled. In fact, the highest scores in the whole sample were made in one of the poorest schools, Sujia. The placement of Burkel, also a "poor" school as second highest is questionable, as in this one school the copying of responses did noticably affect the individual scores. Before any positive hypotheses can be drawn between the educational system and the development of achievement motivation, further research should be carried on to determine the different types of teaching methods employed in the various schools tested. It has been pointed out that although the Sujia school has a poor reputation for educational standards, the teacher employs the methods of Basic Education in conducting his classes. This includes a relative degree of freedom for the students, and the encouragement of creative projects and learning-through-doing on their part, rather than the strictly disciplined, rote learning methods of the more conventional system. This claim has not been investigated, but, if true, it would tend to conform to the conditions McClelland has set for the development of high achievement motivation within an educational system.[7]

A further research lead is suggested by the sample from Sujia. In this school, students come almost entirely from the milk-man caste, and in the village itself there are no members of the Gauntia caste, the hereditary village headmen. Among the castes of the area the milk-men

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[7]McClelland, op. cit., pp. 42 f.

tend to be more involved in precise commercial activities than others, as they are responsible for collecting milk in the morning and delivering it fresh to cash customers, most of whom live in Barpali Village, some eight miles from Sujia. Without Ganutias in the village, patterns of traditional caste reciprocity do not develop to as high a degree as in most villages, and an individual's activities can be directed to a larger extent toward purely entrepreneurial spheres. Such relationships between caste and achievement motivation should become clearer when complete data on all of the subjects tested are analyzed.

It should be noted here that problems arise in administering this test to village children in a village situation. These problems appear on the whole not to be significant, but may affect the scores to some extent. The only clear evidence of this was the case of copying at Burkel. This problem was discussed in section II. The problem of explaining the unfamiliar test procedure and the associated difficulty in getting some subjects to start drawing soon enough to produce more than one or two responses within two minutes can probably be overcome by more careful preparation in future tests. One difficulty has arisen twice where the teacher has amplified the instructions, in one case telling the students to draw any <u>one</u> of the designs he saw on the stimulus design, and in the other telling them to draw whatever they saw "like tomatoes, guavas, etc." In the first case, even after a member of the testing team had explained to the students that they should draw <u>as many</u> designs as they could remember or thought might have been there, the number of individual responses remained very small. In the second case, inspite of being told that these designs did not

represent anything, the majority of subjects did draw tomatoes, guavas, houses, etc. Finally, the validity of the Sp. score is questioned for two reasons. The students use their slates as backing for the test paper, and as the slates are about half the size of the paper, utilization of the entire sheet requires that it be moved at least once on the slate. Consequently, a large majority of the responses are confined to the upper half of the page. Although this aspect of the problem could easily be solved by providing each subject with an 8" x 11" or larger board for backing, it is questionable whether the scores would be valid, or at any rate comparable with Sp. scores obtained in the west. This is because, due to the scarcity of material on which to write, students are taught to work with very small figures, starting from the extreme upper left hand corner of the page. Although some subjects' papers are much more extreme in this respect than others, most do tend to be concentrated in this area. Of the very few subjects who utilize the entire page, almost all score very highly in the other categories. Therefore, although Sp. scores may be valid for the extremes of the distribution, it is doubtful whether they have any meaning in the middle range.

5. Proposals for Further Research. Further research is needed to test the hypotheses discussed in the preceeding section. Specifically, two broad areas of work are seen to be necessary in this connection, 1) further testing and collection and analysis of additional data on the individuals tested, and 2) action programs designed to develop or utilize high achievement motivation.

It is proposed to carry on programs to test the NES village level workers in the Barpali Block, all mechanical trainees and health worker trainees both at the beginning of their training and at the completion of it, additional children from schools in the Barpali area, if the findings from the analysis of our present sample seem to justify it, samples of children from Basic Schools and conventional schools in the area of Angul, and, if possible, representative groups of adult villagers, including among them progressive leaders and entrepreneurs. Supplemental data will be slightly different for each of these six groups. For the NES village level workers, data comparable to those collected in the evaluation of B.V.S. village level workers must be obtained. As much information as possible, derived from both subjective and objective measurement, should be gathered on health worker and mechanical trainees. As these two groups are centered at the project . they can, in a sense, serve as models, both for obtaining more precisely correlated data,[8] and for sharpening techniques for increasing achievement motivation through training. In the case of the mechanical trainees it will be important to keep close track of the graduates, observing which ones carry their new skills into entrepreneurial fields. In the same way, socio-economic data on school children must be closely analyzed to determine where different types would be more useful, and these collected in any subsequent test samples. Similar, comparable data must be gathered for testing programs involving different types of schools or different groups of adults.

Both to test these hypotheses and to further developmental work, it is proposed to carry on "action programs" in three areas. The first

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[8] And if necessary, reformulation of hypotheses about the correlation of n-Achievement with categories of performance. See n. 6, above.

program, on which work can be started almost immediately as part of an on-going B.V.S. project, is in working with village schools in the development of more effective curricula, designed to foster the development of achievement motivation in the students. To begin with, it would seem advisable to choose two or four schools from the original test sample, including both Sujia and Ambapatra (highest and lowest mean scores) and possibly Bandhpali and Lenda. After a year of working with the teachers and students, the latter should be retested to determine any increase in their n-Achievement scores, and whether the increase is greater or less in the cases where the scores were originally high. To be acceptable to Government, and in order to reproduce the experiment elsewhere if it proves successful, changes and improvements in the curricula must be directed toward demonstrably educational goals. Government, particularly, is skeptical of outside agencies avowedly attempting to "manipulate" motivation in school children or other groups, although such "manipulation" may be only a different, perhaps more direct, means of achieving the professed ends of Government programs.

The second action program would allow more open emphasis on developing achievement motivation, as it would be in the context of an experimental training situation. Here it is proposed to establish a nursery school as part of a training program for Gram Sevikas (women village workers). The nursery school run on principles set down by B.V.S. would serve as a model for the trainees to establish in the villages after the completion of their training. Although this program would seem to be ideal as an action program for the development of achievement motivation, the whole question of the establishment of

a Gram Sevika training center in Barpali is still in the stage of negotiation between Government and B.V.S. It is hoped that agreement can be reached sometime during the Spring of 1959 so that the program, including the nursery school can begin operating by August or September 1959.

The final action program involves the utilization of high achievement motivation rather than its development. Although no systematic program is at this point envisaged, informal, though carefully planned steps can be taken to encourage the placement of men with high n-Achievement in any positions requiring leadership or business managing ability that may occur in the local area. If an adult testing program can be initiated, determination of available achievement motivation will be facilitated, and perhaps B.V.S. can take stronger steps in placing and creating places in the community for individuals with high achievement motivation.

In conclusion, on the basis of the present preliminary test samples, it seems desirable for B.V.S. to continue using the measurement of achievement motivation as a tool in its developmental work. Most fundamental would be the action programs for developing high achievement motivation and for utilizing it in the development of the community. Studies made of correlations of test scores and socio-economic data, either with children or adults, might well prove valid hypotheses which could be useful on a broad scale in identifying groups most susceptible to social and technological change. Finally, a testing program for the trainees at B.V.S. will help assess the success being made in a given direction and will allow the sharpening of techniques to achieve the desired ends.

(February, 1959)

III. MEASURING ACHIEVEMENT MOTIVATION

Correlation of Data on School Children Tested for Achievement Motivation

1. Introduction. The following report attempts to analyze achievement motivation scores of 159 school children of Barpali district in relation to additional socio-economic data collected for each subject.[1] It was desired to test the hypotheses which had been formulated in the previous report as well as to form any other valid generalizations about the relationships between achievement motivation and the socio-economic data at hand. The specific hypotheses to be tested were, 1) that there is a significant relationship between achievement motivation as measured by graphic expression and developmental initiative and leadership, and 2) that there is a more significant relationship between the caste or social group to which an individual belongs and his achievement motivation than there is between educational standards and the development of achievement motivation within the individual.

2. Procedure. For each of the 159 school children given the test for achievement motivation through graphic expression, the following information was collected by the village level worker in whose area the schools were located:

1. Name, sex, grade of each child (given on test paper)
2. Age of child
3. Child's most recent school marks and class rank
4. Number of adults in household
5. Number of children in household

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[1] See "Measuring Achievement Motivation: Report of Preliminary Study and Proposals for further Research" (Barpali Village Service, Feb. 1959) for test results. Four students in the original sample of 163 had to be dropped from the present analysis because of insufficient data.

6. Primary and secondary occupations of father

7. Number of acres owned by father or other family members (if father is an agriculturist, his relative economic status can be judged by this figure, otherwise his occupation will be used to determine his status)

8. Caste

9. What position of formal or informal leadership does the father hold in the community of his caste

10. What improvements (from B.V.S. or National Extension Service) has the family accepted (e.g., latrines, Japanese paddy cultivation, family planning, etc.)

It appeared on preliminary analysis of the data that only the last five of these categories could be used to obtain meaningful results. Age, sex, school marks and size of family seemed to have no relationship whatsoever with any of the other variables or with achievement motivation scores. School marks and class ranking could not be used except for an overall correlation with the D-F score because of the lack of uniformity in the marking systems of various schools. Furthermore, the data themselves and the correlation with n-Achievement indicated that there is little, if any, relationship between school achievement as measured by these grading systems and achievement motivation.

Except for caste, the variables (D-F score, acerage, non-agricultural occupation, improvements, and leadership) were handled equivalently. Product moment correlations between each of the variables were calculated and partial correlations were established indicating the true relationship between two variables with the influence of the remaining

three held statistically constant. All variables were also tabulated for each caste, and, on the basis of caste means, correlations and partial correlations were calculated for the entire sample and for two individual caste groupings.

It must be pointed out here that whereas the achievement motivation scores and the school marks appearing in the results refer to the children actually tested, the acreage, non-agricultural occupation, improvements and leadership measurements are for the children's fathers. Although this fact must to some extent effect the validity of the results, this effect should not be too great. In fact, correlations between these variables and the achievement motivation scores of the adults could be expected to be higher than the results obtained. This method of correlation is justified by the fact that achievement motivation is developed within the context of the family, particularly in rural India where other social groupings fail to influence developing children to any marked degree.[2] The assumption in this analysis is that the achievement motivation of the child, having developed in a family dominated by the father, will be close enough to the father's to produce statistically valid results.

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[2]See discussion on influencing motivation in David C. McClelland, "Community Development and the Nature of Human Motivation, Some Implications of Recent Research," Background Paper, Conference on Community Development. Cambridge, Center for International Studies, Massachusetts Institute of Technology, Dec. 13-15, 1957. Page 42. See also pp. 18-19.

Caste	Number of Cases	Mean	S.D.	Limits of Reliability .05 level	.01 level
Teli	3	10.7	1.14	±2.84	± 6.55
Gaud	15	7.7	6.93	±3.85	± 5.27
Brahmin	8	7.1	9.29	±7.74	±11.48
Ganda	20	6.8	4.73	±2.22	± 3.03
Bhulia	7	6.7	4.46	±4.14	± 6.27
Keut	6	6.2	5.26	±6.53	±10.81
Sahara	15	6.0	7.68	±4.25	± 5.92
Kuli	6	4.7	2.77	±2.90	± 4.55
Kulta	52	4.2	6.25	±1.77	± 2.36
Binjhal	6	3.5	8.58	±9.00	±14.11
Gand	7	2.7	2.49	±2.21	± 3.34

TABLE I. Caste Means and Standard Deviation for Achievement Motivation. (Range of reliability based on t-scores.)

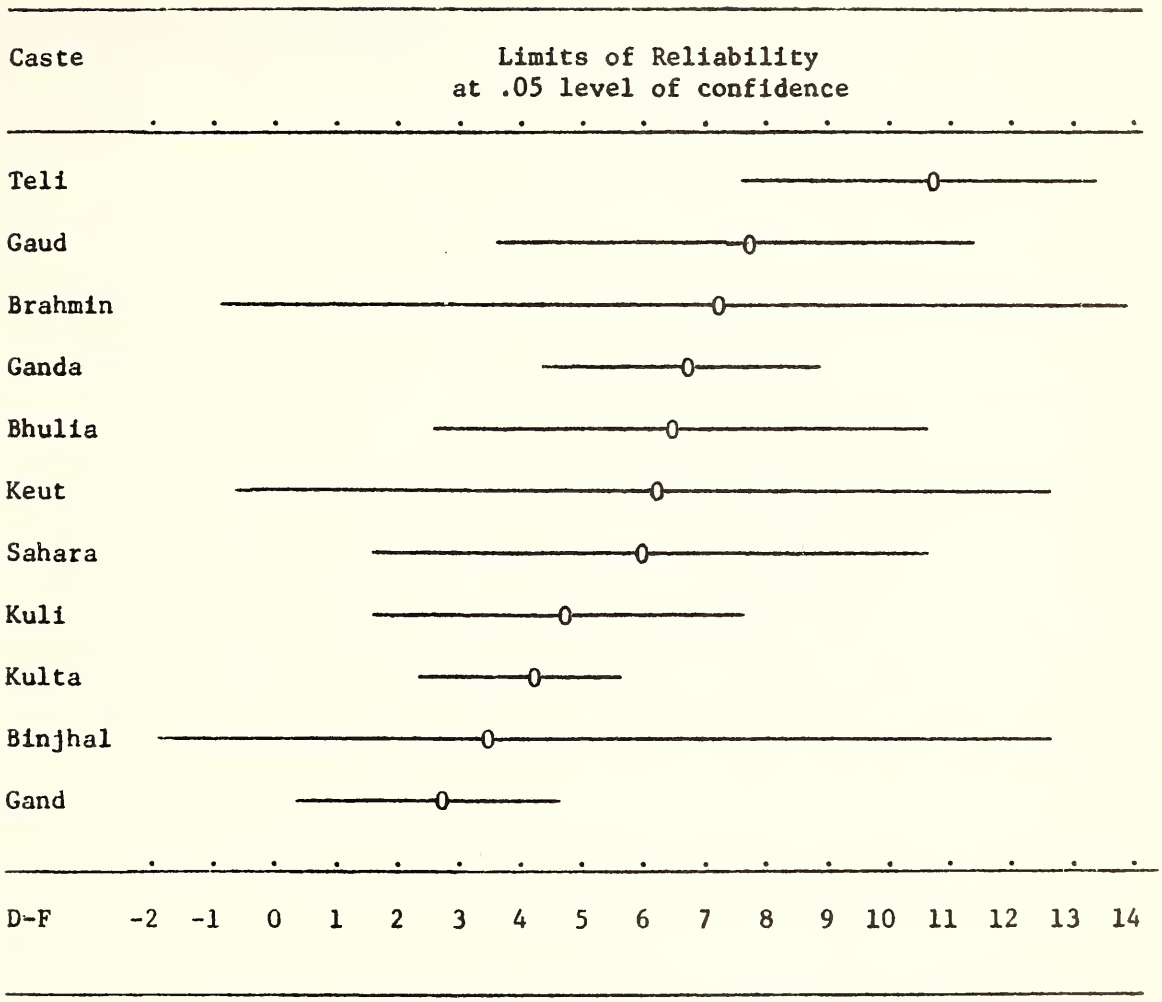

FIGURE 1. Caste Means for Achievement Motivation and Range of True Mean .05 level of Confidence.

Variables	Correlations Simple	3rd Order	1st & 2nd Order
D-F-school marks	-.12	-	
D-F-acreage	.11	.32	
D-F-improvements	-.28	-.33	
D-F-occupation	-.08	.04	
D-F-leadership	-.12	-.13	
Acreage-improvement	.36	.49	
Acreage-occupation	-.60	-.64	
Acreage-leadership	.48	.49	
Improvement-occupation	-.25	-.12	$r_{io.a}$=-.05
Improvement-leadership	.33	.18	
Occupation-leadership	-.09	.31	
Significance .05	$\pm$.16	$\pm$.16	
.01	$\pm$.21	$\pm$.21	

TABLE II. Correlations among Variables (Total Sample).

Variables	Simple	Correlations 3rd Order	1st & 2nd Order	
D-F-acreage	.26	.87		
D-F-improvements	.12	.34		
D-F-occupation	.09	.07		$r_{do.ai}$=.23
D-F-leadership	.04	-.33		$r_{dl.io}$=-.41
Acreage-improvements	.55	-.42		
Acreage-occupation	-.73	-.30		
Acreage-leadership	.86	.88	$r_{al.o}$=.68	$r_{al.io}$=.5[illegible]
Improvement-occupation	-.30	.15		
Improvement-leadership	.69	.72		
Occupation-leadership	-.77	-.55		$r_{ol.id}$=-.84
Significance .05	±.58	±.67	±.60	±.63
.01	±.70	±.80	±.74	±.77

TABLE III. Correlations among Variables (Caste Means).

Variables	Correlations Simple	3rd Order	1st & 2nd Order
D-F-acreage	.26	.30	
D-F-improvements	-.19	-.22	
D-F-occupation	-.09	.02	
D-F-leadership	-.11	-.12	
Acreage-improvement	.15	.13	
Acreage-occupation	-.29	-.30	
Acreage-leadership	.24	.25	
Improvement-occupation	-.12	.06	
Improvement-leadership	.27	.22	
Occupation-leadership	.01	.11	
Significance .05	±.27	±.28	
.01	±.35	±.37	

TABLE IV. Correlations among Variables (Kulta Caste).

Variables	Simple	Correlations 3rd Order	1st & 2nd Order	
D-F-acreage	.19	.27		
D-F-improvements	-.33	-.35		
D-F-occupation	.14	.15		
D-F-leadership	-.09	-.09	$r_{dl.a}$=-.21	$r_{dl.ao}$=-.21
			$r_{dl.i}$= .03	$r_{dl.io}$= .02
Acreage-improvement	.15	.03		$r_{ai.do}$= .22
Acreage-occupation	.10	.02		
Acreage-leadership	.47	.45		
Improvement-occupation	.08	.09		
Improvement-leadership	.37	.29		
Occupation-leadership	.08	.02		
Significance .05	±.47	±.51	±.48	±.50
.01	±.59	±.64	±.60	±.62

TABLE V. Correlations among Variables (Teli and Gaud Castes).

3. Results. Caste means for achievement motivation are presented in Table I. Figure 1 indicates these means graphically together with the range of variability of sample means around the caste True Mean at the .05 level of confidence. (In other words, in 95 cases out of 100 the true caste mean for achievement motivation will fall somewhere along the lines on either side of the sample mean. The length of this line, and thus the reliability of the statistic, is determined by the number of cases in the caste sample and their variability: the fewer the cases and the greater their deviation from the sample mean, the longer the line.) Although seventeen different castes were represented in the sample, only eleven produced sufficiently reliable means for inclusion in these results and for subsequent correlations.

Correlations between variables are presented in Tables II through V. Table II presents correlations of the total sample, Table III the correlations of caste means for each variable, Table IV correlations of each variable within the Teli and Gaud castes, and Table V correlations within the Kulta caste. Each table presents in the second column the overall, simple correlations of the data and in the third the same correlation with the influence of the other variables partialled out. In the fourth column will be found any first and second order correlations significantly different from those presented in the second and

third columns. These first and second order correlations will be identified by subscripts, those to the left of the decimal indicating the related variables, those to the right the variables partialled out or held constant (e.g., $r_{di.aol}$ indicated the correlation between the D-F score and improvements with acreage, occupation and leadership partialled out).

4. Discussion.

Caste Means. Although the differences among means for achievement motivation of the various castes included in the test sample are not statistically significant, except at the extremes of the distribution, they are nevertheless highly suggestive. Listed below are the traditional occupations of each caste ranked according to their achievement motivation means as given in Table I and Figure I.[3]

Teli - Oil pressing

Gaud - Milking and cattle tending

Brahmin - Religious, priests, etc.

Ganda - Weaving

Bhulia - Weaving

Keut - Puffed and chapped rice, fishing

Sahara - Cultivation

Kuli - Weaving

Binjhal - Village priests (Tribal)

Kulta - Cultivation

Gand - Cultivation (Tribal)

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[3]See Nityananda Patnaik, "Caste and Occupation in Rural Orissa," Man in India, 34:4, Oct. - Dec. 1954. Pp. 257-270.

According to McClelland's hypothesis[4] entrepreneurial behavior is characterized by high achievement motivation, while agriculturists tend to be conservative and traditional with a lower degree of achievement motivation. The results of this sample tend to confirm this hypothesis. The two castes making the highest mean scores for achievement motivation were the oil pressers and the milkmen. In both of these cases the caste occupation involves the production and sale of commodities. Although the Keut occupation of making and selling puffed and chapped rice and fishing would appear to be entrepreneurial, all of the Keuts in this sample were primarily cultivators, only a few of them dealing in puffed rice as a secondary occupation. There was greater variation of individual scores among the Brahmins than in any other caste in the sample, due possibly to the fact that some of the members of this caste are exclusively cultivators while others are priests and teachers. Although this caste sample was small, two of the highest scores in the total sample were made by Brahmins. Just below the Brahmins rank two weaving castes, followed by the Keuts and Saharas and then the third weaving caste. Except for the placement of this weaving caste, the Kulis, all of the lowest castes are cultivators. Although the traditional occupation of the Binjhals is tribal village priesthood, all Binjhals in this sample were cultivators only. Of the cultivator castes, the Gands are by far the most prosperous and the Binjhals the least, while the Saharas and Kultas fall in the middle. The question of the correlation between economic status and achievement motivation will be discussed in the following paragraphs.

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[4] McClelland, op. cit., pp. 3 ff., 28.

Correlations - Achievement Motivation. As pointed out in section 2 there appeared to be no correlation between school marks and achievement motivation. David McClelland says on this subject, "the students around the world who worked hardest on the problems I gave them to do regardless of incentive conditions were not those with the highest n Ach. but those who had good conservative upbringing with early stress on caretaking."[5]

Correlations between achievement motivation and measures of economic status (acreage and non-agricultural occupation) point up an interesting difference between castes. In all cases there is a positive correlation between acreage and achievement motivation. Correlations between D-F score and non-agricultural occupations, however, range from negative to positive, although none is statistically significant at the .05 level of confidence. In the case of the agricultural castes and of the total sample where agriculturists heavily outweigh other occupational groups, there is a negative correlation between the two variables which becomes only just positive when other factors are partialled out. This is probably due to the fact that, in the case of the agriculturists, those having the lowest economic status, that is the least acreage, are required to find other employment. Had agricultural labor been included in the category of occupation, this negative correlation would have been much more marked. In the case of the Teli and Gaud castes, and in the correlations between D-F score and non-agricultural occupation based on caste means, where each caste is weighted equally, the correlation is positive and is increased by

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[5]Personal communication, Feb. 15, 1959. (Italics in original.)

partialling (in the caste mean correlations this is true of the second order correlation where leadership is not partialled out, see below). This is a reflection of the fact that in these two castes and in at least three others, non-agricultural occupations are more important factors in economic status than acreage. Within the Teli and Gaud castes it is the individuals with the higher achievement motivation who devote the largest portion of their time to their entrepreneurial caste occupations; and because the non-agricultural castes are highest in achievement motivation, a positive correlation is to be expected between these two variables.

Correlations between achievement motivation and the acceptance of improvements are, except for the correlations based on caste means, entirely negative. This would seem to indicate, although the correlations are not statistically significant, that there is a tendency for castes characterized by high achivement motivation to accept improvements more readily than the lower, agricultural castes. Several factors must be considered here. The weavers who belong to higher achievement motivation castes have accepted improvements on their looms. Among these weaving castes most families require the services of school age children, so that it is only the children of more "progressive" weavers who are sent to school and who are represented in this sample. These positive correlations were obtained from caste means rather than individual scores, so that the positive correlations would not hold true for the total sample unless the members of each caste were equal in number. Finally, the two castes highest in achievement motivation show a negative correlation between these variables, thus it is entirely

possible that the three weaving castes are to a large extent responsible for the positive correlation found in the caste mean group, and that except in relation to these castes the correlations can be considered to be negative.

At first glance the negative correlations would seem to imply a contradiction in the hypothesis that holds that economic development is related to high achievement motivated entrepreneurial behavior. The contradiction, however, lies in the definition of the category "improvements." Except for the introduction of one latrine and the relatively few cases of modifications in weavers' looms, all of the improvements in this sample were in agricultural practices. As pointed out above, cultivators tend to have lower achievement motivation than other castes, and thier occupation is essentially tradition-bound and conservative. Agricultural improvements, while contributing slightly to overall economic development, serve more to entrench this conservative occupation and to discourage branching out into new entrepreneurial fields which would have greater effect on national and regional economic development. Even though there is a positive correlation between achievement motivation and economic status as measured by acreage, the fact that improvements are usually accepted only by the larger landholders does not seem to influence greatly the general picture of an inverse relationship between achievement motivation and the acceptance of agricultural improvements.

Correlations - Leadership. In all cases there was a high correlation between leadership and acreage which remained fairly constant when other variables were partialled out. Correlations between leadership and non-agricultural occupation were found to be both positive and negative but of little statistical significance. Exceptions to this occured in

the third order correlation for the total sample where r = +.31 (significant at the .01 level of confidence) and in the caste mean correlations where the unpartialled correlation was -.77 (significant at the .01 level of confidence) and where the correlation between leadership and occupation with all variables except acreage partialled out was -.84. Generally, then, it can be said that in these agricultural communities an individual's agricultural status is a positive factor in his assumption of leadership.[6] Because the communities are largely agricultural, non-agricultural factors which might be of importance in determining leadership within some castes do not operate significantly in the village as a whole. With the effect of acreage (agricultural status) partialled out a significant positive relationship does appear for the total sample. The negative correlation in the caste mean group can probably be explained by the fact that most of the positions of leadership are filled by the dominant agricultural castes in which means for non-agricultural occupation were decidedly lower than for the non-agricultural castes.

In all cases, except the unpartialled correlations in the caste mean group, correlations between leadership and achievement motivation were slightly negative (in no case significant at the .05 level of confidence). The reason for this result is probably that mentioned above that the leaders in the community generally come from the dominant

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[6] A program of achievement motivation testing is presently being conducted by BVS among village leaders in the area. Analysis of socio-economic factors is expected to confirm this generalization and to throw light on other points raised in this paragraph.

agricultural castes whose D-F scores are lower on the average than the non-agricultural castes. In every case there was a strong positive correlation between leadership and improvements. This is to be expected because of the positive correlations found between improvements and acreage and between leadership and acreage. It is because of this relationship between leadership and improvements as well as the negative correlation between achievement motivation and improvements in the Teli and Gaud castes that the first and second order correlations between achievement motivation and leadership vary from -.21 (where the effect of the correlations with improvements are partialled out) to +.03 (where these only are held constant).

Correlations - Economic Status. These correlations have all been mentioned in the discussions above but will be summarized below. In all eases except caste means, partial correlations of which were negative because of the different weighting of this group, there is a positive correlation between acreage (agricultural status) and improvements. High negative correlations occur between acreage and non-agricultural occupation except in the Teli and Gaud castes where there is a small psoitive correlation. The reason for this is that economic status in these castes is determined to a large extent by the non-agricultural occupation while the amount of land simply adds to this status. Correlations between improvements and non-agricultural occupation are similar to those between acreage and non-agricultural occupation but are not as significantly negative. All of them shift in a positive direction when other variables, particularly acreage, are partialled out.

5. Conclusions. Although the statistical results of this analysis are not sufficiently reliable to make any positive statements, they point in the direction of serveral significant generalizations. There appears to be a difference in the mean achievement motivation scores of the various castes; those castes whose traditional occupations are entrepreneurial being higher than the agricultural castes. This tends to cnnfirm the hypothesis that there is a significant relationship between achievement motivation and entrepreneurship. This observation coupled with the insignificant correlation obtained between school marks and achievement motivation scores gives weight to the second hypothesis in the introduction that there is a more significant relationship between the caste or social group to which an individual beongs and his achievement motivation than there is between educational standards and the development of achievement motivation within the individual.

Correlations among achievement motivation scores and socio-economic variables do not present as consistent a picture. In general, however, the following tendencies emerge from the data. There is a strong positive relationship between agricultural status (acreage) and community leadership, and somewhat weaker relationships between agricultural status and the acceptance of improved practices (mainly agricultural), between agricultural status and achievement motivation, and between the acceptance of improved practices and community leadership. Negative relationships appear strongest between agricultural status and non-agricultural occupation (except in the non-agricultural castes where the relationship between occupational status and agricultural acreage is slightly positive). They are less strong between achievement

motivation and the acceptance of improved practices, and between achievement motivation and leadership within the agricultural community. Figure 2 presents these relationships graphically.

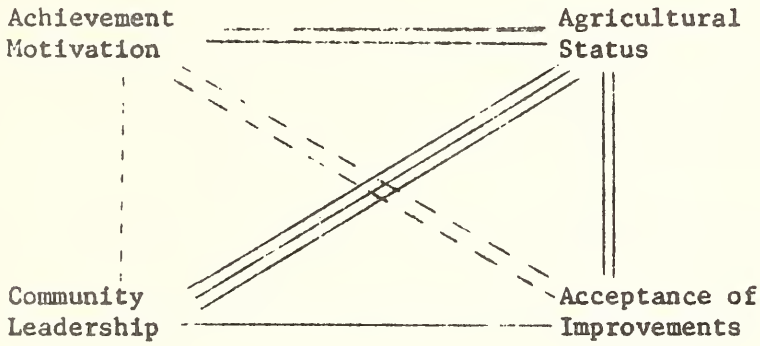

FIGURE 2. Diagram of important positive and negative relationships. (Solid lines indicate positive, dotted lines negative relationships.)

The first hypothesis formulated in the introduction that there is a significant relationship between achievement motivation and developmental initiative and leadership is not borne out by the correlations obtained. In fact, the correlations between developmental initiative (defined in the sample as the acceptance of improvements) and achievement motivation and between leadership and achievement motivation were almost completely negative. As pointed out above, however, the improvements which were accepted in this sample were largely agricultural and consequently were less prevalent among the non-agricultural, entrepreneurial castes. The acceptance of weaving improvements in these entrepreneurial castes is perhaps reflected in the positive correlations between achievement motivation and improvements when calculated on the basis of caste means where the preponderence of agriculturists in the total sample had

no greater weight than the less numerous entrepreneurs. Similarly, leadership in a predominantly agricultural community is drawn largely from the agricultural castes, and it is precisely those individuals who accept improved agricultural practices who tend also to be the leaders in the community. Thus it is not surprising that within this frame of reference leadership, like acceptance of improvements, should correlate negatively with achievement motivation.

Further studies on the relationship between achievement motivation, leadership and the acceptance of improvements (or another, more precise measure of developmental initiative) will have to be conducted, particularly in communities with a relatively small agricultural population, to test more thoroughly this hypothesis. However, on the basis of the present data it would seem justifiable to say that rather than reject the hypothesis, the equation of acceptance of improvements with developmental initiative should be carefully examined to determine whether these are not really two distinct factors.

(April, 1959)

NOTES ON ENTREPRENEURIAL BEHAVIOR OF FORMER MECHANICAL-TRAINEES[1]

In the spring of 1960 a survey was conducted to discover in what ways former trainees in the Barpali Village Service "village mechanics' training program" were utilizing the knowledge and skills they had learned during their training. On the basis of the former trainees' statements and information collected about them in their villages, they were grouped into four categories of present occupation. The first group comprised those individuals who were working full-time in a business of their own which was directly related to the training they had received. These men were primarily engaged in carpentry or mechanical repair work. The second group included men who took on jobs related to their training whenever these were available (i.e., not full-time); all of these men regretted that they were unable to find sufficient work to keep them occupied full-time. These men, on the whole, were engaged in carpentry work, although there tended to be more variety in their jobs than in the case of the first group. The third group consisted of men who were either employed, usually by contractors, in work related to their training, or who were pursuing further study in this

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[1] The findings presented in these notes have been published elsewhere, thus no attempt has been made below to give more than a summary outline of the results of this phase of the Orissa achievement motivation testing program. See David C. McClelland, The Achieving Society (Princeton: D. Van Nostrand Co., 1961) pp. 271-73 for an analysis of these data in terms of McClelland's theory of the development of and utilization of entrepreneurial skills. T. M. Fraser, Barpali, Case Studies in Community Development (in press) devotes a chapter to the village mechanics' training program, and provides considerable detail on the development and organization of the actual training, and the philosophy of its integration into the total program of Barpali Village Service.

field. Only two were engaged in study at the time of the survey, one in carpentry, the other in blacksmithy. Most of these individuals did not have full-time employment, and practiced agriculture approximately half of their time. The fourth group was made up of those individuals who were primarily engaged in agriculture or other occupations not related to their training. Most of the men placed in this group did, however, do odd jobs related to their training either for themselves or for others in the village. Such jobs included making occasional door or window frames for new houses or taking care of the maintenance of village pumps. Only a few of them appeared to be doing nothing at all related to their training.

Almost all of the trainees were young men. The average age of all men trained was twenty-four, and many were only in their late teens. It had been hoped by Barpali Village Service that a fair number of older men, established in their villages either as craftsmen or cultivators, could have been drawn into the program to learn new techniques and broader applications of their skills. Most of the trainees were men who lacked the mature responsibilities of established villagers toward their families and communities. Furthermore, it was apparent from the application forms submitted for training and from interviewing former trainees, that a considerable number of them saw in the training program a means of enhancing their standing in the community or even of breaking away from the village altogether. In large part they viewed the training as vocationally oriented, potentially capable of being put to use in a trade or at least a form of training which per se would ensure the individual a somewhat higher status in his village.

The program itself, however, had been specifically designed to limit the technical training to a point below that required for an individual to enter easily into urban trade or industry, and even to discourage vocational specialization in the rural village. Barpali Village Service hoped this limitation would make mechanical skills and knowledge generally available in the villages by means of trainees returning to their former occupations and community positions. However, because of the attitudes which many of the trainees brought with them and their reasons for learning as a means of separating themselves from the community or their former position in it, the purpose of this limitation may not have been fully attained.

In the "notes" on former trainees which follow the table, it will be noticed that a number of the men were retested for achievement motivation. Often the test-retest scores were significantly different. In formulating the table, and also in McClelland's analysis of these data, only the highest score (whether test or retest) has been used. The rationale for this step is that the higher score represents what the subject can do, and is therefore, in terms of entrepreneurial research, the more meaningful of the two scores. The aptitude scores appearing in the "notes" refer to a test of mechanical aptitude given all trainees at the beginning of the course. This test sought to assess the trainee's ability to use tools, to deal with spatial relationships, and (except for one group) to read and write. No significant relationship was found between these aptitude test scores on the one hand and a) measures of achievement motivation, b) success in completing training, or c) type of occupation after training.

TABLE 1

VILLAGE MECHANICS' TRAINING PROGRAM
Achievement Motivation Scores and Occupation before and after Training

	Subject	D.F.	Occupation Before Training	Occupation After Training
GROUP I	P.D.	23	Cycle repair, agricultural labor, herbal medicine	Cycle repair, diesel work, masonry
	C.P.	16	Agriculture, carpentry	Carpentry business with hired assistant
	C.S.	13	Agriculture	Full-time cart-wheel manufacture
	T.P.	16	Silversmith, cycle repair	Silversmith, tool manufacture, add jobs
	MEAN	17.00		
GROUP II	C.B.	13	Agriculture, masonry	Agriculture, odd building jobs, pump repair
	K.S.	13	Agriculture, carpentry	Agriculture, carpentry
	P.P.	7	Agriculture, carpentry	Agriculture, house building, instructs local carpenters
	D.B.	4	Agriculture	Agriculture, odd jobs, has worked for contractor
	P.M.	10	Agriculture, priest	Agriculture, cot making, loom improvements
	MEAN	9.40		

GROUP III	K.M.	11	Agriculture, dairy	Carpenter's assistant
	P.S.	9	Agriculture, carpentry	Assists local carpenters
	B.S.	5	Agriculture	Further training in carpentry
	C.N.	5	Agriculture, carpentry	Further training in blacksmithy
	D.D.	5	Sweet maker	Unemployed, has worked for contractor
	MEAN	7.00		
GROUP IV	D.S.B.	16	Labor, agriculture	Agriculture, odd carpentry jobs
	J.S.	10	Agriculture, some carpentry	Agriculture, some carpentry for own use
	K.R.	7	Agriculture, labor	Agricultural cooperative employee
	K.B.	1	Agriculture	Agriculture
	S.P.	-13	Student	Weaving cooperative employee
	MEAN	4.20		

FOLLOW-UP NOTES ON MECHANICAL TRAINEES (Barpali thana)

P.D. (Gopaipali, Session III, aptitude score missing, n-Ach = 23)
Does cycle welding, diesel work, soldering, masonry. Villagers come to him for help in masonry, carpentry. Charges "nominal fees" to villagers; takes orders from govt. agencies (e.g., cement hume pipes). Sometimes helps on projects at BVS shop; takes jobs as they come, has no capital for building up stock of (e.g.) furniture for sale. Owns no land; practices homeopathic medicine.

J.S. (Manpur, Session III, aptitude score missing, n-Ach = 10)
Only child of a well-to-do, landed family. Has constructed almirah (clothes closet), plow, brick cattle feeding trough, latrines - for use of own family. Due to training at project has improved cultivation methods, uses latrine. Would be willing to work for others, but no one in this small village brings him jobs to do. Sometimes helps out friends on mechanical, masonry, carpentry jobs. People say he is "too rich" to do this kind of work.

P.M. (Bandhpali, Session III, aptitude score missing, n-Ach = 10)
Average earnings from carpentry (mostly cot making and loom repairs) is Rs. 2 to 3 per day. Had no skills prior to training, but enjoyed helping itinerant carpenters. Also engages in cultivation and priestly duties. He wants to take advanced training so that he can do "fine work." Works mostly for the poor people as others are able to afford professional carpenters from outside the village.

C.N. (Agalpur, Session III, aptitude score missing, n-Ach = 5)
Worked as clerk in dispensery for four months after training; then entered government training school, Balangir, to study blacksmithing.

C.B. (Rabanguda, Session IV, aptitude = 24, n-Ach = 10, retest = 13)
Had done some work in village repairing pumps, helping on construction of school building. Tried to get work on govt. building in nearby village, but "professional" carpenters were required. Is willing to take on any jobs in the village but there are none (this is a small backward village).

D.B. (Barlabahal, Session IV, aptitude = 44, n-Ach = 2, retest = 4)
Main occupation is cultivation, but when time permits he does private carpentry and masonry jobs; has worked at brick laying and carpentry for contractor, and at present is working on construction of a health worker center in his village. Has helped with construction of several houses.

C.S. (Kumbhari, Session IV, aptitude = 39, n-Ach = 5, retest = 13)
Full-time work making bullock cart wheels for sale (Rs. 60 to 80 per pair, Rs. 100+ if rimmed with iron). Occasionally makes tati (bamboo screens) or furniture on order, but there is more demand for wheels than he can fill. Manages to cultivate small amount of land in his spare time.

C.P. (Padhanpali, Session IV, Aptitude = 61, n-Ach = 16, retest = 7)
Has set up a shop in his village and taken on an assistant, makes mostly door frames and doors and loom parts. Has worked on govt. buildings in area. Villagers are impressed by his new ability, "he has the courage

to tackle hard jobs. Has invested in a considerable supply of lumber (Rs. 155 worth) for future work. Before starting his village shop, he spent 15-20 days each month working on his own jobs in a considerable supply of lumber (Rs. 155 worth) for future work. Before starting his village shop, he spent 15-20 days each month working on his own jobs in the BVS shop (10 miles from his village).

D.D. (Remta, Session III, Aptitude score missing, n-Ach = 5)
Traditionally a sweet maker. After training had a job with contractor making stools and tables (Rs. 1 per day). Left the job because of "trouble with money." He has been out of work for some months and is being supported by his brothers.

T.P. (Kainsir, Session III, Aptitude = 80, n-Ach = 16)
Has helped in development of projects at BVS shop; tried for a full-time job in shop but could not be taken on. Work in his village is seasonal: he has been in charge of construction of several houses, will build weeders for the cultivators during monsoon. When he is unable to find this type of work he supports himself with his traditional occupation of silversmithing.

K.M. (Barpali, Session IV, Aptitude = 43, n-Ach = 11, retest = 8)
Working as a carpenter's helper at Rs. 2.50 per day.

P.S. (Amapatra, Session IV, Aptitude = 51, n-Ach = 5, retest = 9)
Full time work as assistant in BVS shop; also helps out a village carpenter. Fellow villagers have become conscious of his carpentry skills and now come to him with their jobs.

B.S. (Lenda, Session III, Aptitude score missing, n-Ach = 5)
Taking carpentry training in Govt. training school, Balangir.

P.P. (Lenda, Session IV, aptitude = 45, n-Ach = 1, retest = 7)
Takes housebuilding, carpentry jobs whenever he can get them, he has worked on all government construction in Lenda (a govt. show village); does not make furniture regularly because of limited market. He would do this type of work all the time if it were available, his family could take care of the cultivation that he now does when not engaged in building or carpentry. Has specialized in doors and windows. Helps cultivators with their carpentry jobs.

S.P. (Barpali, Session III, Aptitude score missing, n-Ach = -13 (minus))
Has done no work related to his training. Is working as a dyer for a local weaving organization.

K.S. (Sikridi, Session IV, Aptitude = 47, n-Ach = 13, retest =2)
Comes from a family of carpenters, but generally does more agricultural work than others in his family. Takes carpentry jobs whenever they come to him, particularly doors and windows.

D.S.B. (Bisipali, Session IV, Aptitude = 30, n-Ach = 16, retest = 4)
Most of the time he is busy cultivating, plans devoting more time to carpentry when agricultural season is over. Has made plows for himself and family, and helped others. Made doors for nearby club house and for several village houses. He is considering getting a carpentry or masonry job in Barpali or Bargarh (sub-divisional town).

K.R. (Munupali, Session IV, Aptitude = 42, n-Ach = 6, retest = 7)
Busy with local agricultural cooperative, has not been able to devote time to carpentry work. His father is a carpenter, specializing in cart wheels. Kama would like to do the same, take over this father's business. He has helped his father with the construction of two houses.

K.B. (Khairpali, Session III, Aptitude = 91, n-Ach = 1)
Full-time culivation, builds and repairs own tools (so do most other cultivators); has not used his training otherwise at all.

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